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# OPEN ERP ODOO GUIDEBOOK FOR SMALL AND MEDIUM ENTERPRISES

# OPEN ERP ODOO GUIDEBOOK FOR SMALL AND MEDIUM ENTERPRISES

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## ABSTRACT

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ERP systems are vital part of any businesses, For SMEs managing accounting, sales, inventory control, manufacturing, customer relationship all at the same time is not a small task. To meet rising customer demand and market competition business must implement efficient ERP system. Implementing popular high end ERP systems like SAP Business One, Oracle ERP etc. are very costly for SMEs to implement as SMEs lack manpower and financial resources. The current ERP market is poised with various low cost ERP system but fail to deliver high end results. In such situation Odoo ERP is a widely used open source ERP run by the large community of partners and users.

The main objective of this thesis is to prepare an Odoo ERP implementation guidebook for SMEs. The main findings of this thesis guidebook is that it's very important for any business to assess their needs, follow the implementation procedure and test different Odoo implementation options. ERP implementation with poor planning and documentation is an open invitation to failure.

In conclusion Odoo ERP is the cost effective open source software suitable for SMEs. Implementing Odoo has many benefits over big proprietary software vendor SAP business One.

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Keywords: Enterprise Resource Planning, Small and Medium Enterprise, Odoo, SAP Business One, Open Core Software

## CONTENTS

# 1 INTRODUCTION

Business has seen a major overhaul in the IT sector. IT investments in Enterprise Resource Planning (ERP) systems is arguably the biggest investment in any business since the last decade. Traditional paper based business management systems have become history. Different sectors of business like production/manufacturing, supply chain, accounting which used to require a lot human resources, time have been automated to fulfill the quicker demand of the market. Product/service delivery to customers has been faster than ever before. Simple bill payments, shopping are done with a few clicks. This kind of rapid development was possible because of the advanced ERP systems.

Most of the businesses in developed or developing countries have implemented some sort of ERP systems to achieve customer demand and market competition. As implementing high end ERP systems is very costly and it is accessible only for bigger corporations the interest of market has moved to small and medium sized business (SMEs). Open source ERP systems have been developed to meet the demands of all types of commercial and non-commercial business.

Odoo is one of the most popular open source ERP solutions for small and medium sized businesses. This thesis will act as a guide for effectively implementing Odoo ERP in Small and medium sized businesses (SMEs). I have tried to make the Implementation as simple as possible so it can easily be understood by decision makers, business executives, programmer or a user and hopefully answers all the questions related to Odoo implementation.

This guidebook helps SMEs who are looking forward for cost effective ERP solution and cannot afford the cost of implementing high end proprietary ERP software's e.g. SAP, Oracle ERP.

This thesis includes theory section, empirical data on source installation and guided tour of Odoo. Due to the unavailability of Odoo users willing to respond to surveys, a different approach of research was taken, various forums and online reviews were analyzed to study the trends and attitudes of users towards Odoo.

# 2 THEORETICAL BACKGROUND

This chapter covers the concepts and literature related to Enterprise Resource Planning (ERP), Small and Medium Sized Enterprises (SMEs), Functional requirements of (SMEs) and ERP software Odoo.

## 2.1 Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) is a widely-used term for software solutions used in business organizations for managing business activities. Business activities includes product planning, purchasing, manufacturing, supply chain, inventory management, financial accounting, human resource, customer relationship, shipping and payment, business analytics and many more most of these business activities or modules are found in any modern ERP system. Depending on organization requirements these modules can be customized and implemented. American Production and Inventory Control Society (2001) has defined ERP systems as “a method for the effective planning and controlling of all the resources needed to take, make, ship and account for customer orders in a manufacturing, distribution or service company” (Apics, 2001). for further explanation of the concept “ERP systems are configurable information systems packages that integrate information and information-based processes within and across functional areas in an organization” (Kumar & Hillsgersberg, V., 2000).

### Evolution of ERP

IBM and a construction machinery manufacturer jointly brought the concept of Enterprise Resource Planning (ERP) in early 1960s. This application software was used as a method for planning and scheduling materials for manufacturing. (Jacobs, F., ‘Ted’ Weston, FC. 2007). The Gartner INC., the Stamford, conn. based IT consultancy was the first that coined the term ERP in the 1990s, and defined the new phase “ERP II”. “Gartner analyst Brain Zrimsek said ERP II is “an application and development strategy that expands out from ERP functions and achieves integration of an enterprise's key domain-specific, internal and external collaborative, operational and financial processes.” (Gartner Group,1990). The table below shows the evolution history of ERP.

*Table 1: Evolution of ERP (Nerissa, S., Cited:30.11.2016) linkedin.com/pulse/complete-evolution-openerp-odoo-nerissa-scarlett*

| | |
|---|---|
| *2015s* | Real Time Analytics |
| *2010s* | Open Source/on-demand ERP Applications(SaaS) |
| *2000s* | Extended ERP |
| *1990s* | Enterprise Resource Planning(ERP) |
| *1980s* | Manufacturing Resources Planning (MRP II) |
| *1970s* | Material Requirements Planning (MRP) |
| *1960s* | Inventory Control Packages |

Enterprise Resource Planning (ERP) evolution history dates back to 1960s when the manufactures wanted the system for their inventory control. During that time the only way to know the inventory situation was by physical counting. This led to the demand of material requirement planning(MRPs) after invention of MRP in 1970 early inventory control systems sifted to MRP systems. MRP software system helped manufacturers schedule production processes, purchases of raw materials and inventory situation. MRP II software came into use in 1980s with wide range of features helping manufacturers in manufacturing processes, product planning, purchasing inventory control and distribution of products. MRP II was integrated to various other areas of management and engineering like accounting, finance, marketing, human resource and project management this led to the birth of early phase of Enterprise Resource Planning (ERP) software in 1990s. Increasing use of internet, hardware processing power and market demand led to the development of ERP II in 2000s. ERP became a common word for managing all type of business systematically and scientifically. (Balloonone.com, Cited 2.12.2016)

Enterprise Resource Planning software is a multibillion dollar industry with its high cost of licensing, implementation, training and support many enterprises have adopted open source or cost effective ERP systems. Large ERP vendors have now moved their focus from large enterprises to Small and medium sized enterprises. (Rubina, A., Kotze, P., Merwe, A., 2011)

## 2.2 Small and Medium Size Enterprises (SMEs)

Small and medium-sized enterprises(SMEs) are non-subsidiary, independent firms which employ fewer than a given number of employees. This number varies across countries (OECD, cited 30.09.2016). According to European Commission the SMEs are determined by the staff headcount and turnover or balance sheet total it states 'The category of micro, small and medium-sized enterprises which employ fewer than 250 persons and which have turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million.' The table below shows the European Commission categorization of SMEs.

*Table 2: European Commission categorization of SMEs (European Commission Cited 10.10.2016)*

| Company category | Staff headcount | Turnover | or Balance Sheet Total |
|---|---|---|---|
| Medium-sized | < 250 | ≤ € 50 m | ≤ € 43 m |
| Small | < 50 | ≤ € 10 m | ≤ € 10 m |
| Micro | < 10 | ≤ € 2 m | ≤ € 2 m |

SMEs represent 99% of all business in the EU (European Commission, Cited 30.09.2016). According to statistics Finland SMEs are defined as enterprises which have fewer than 250 employees and have either an annual turnover not exceeding EUR 50 million or an annual balance sheet total not exceeding EUR 43 million. (SME, cited 3.10.2016).

In Finland SMEs are defined per EU recommendation 2003/361 which states as those enterprises which have fewer than 250 employees and have either an annual turnover not exceeding EUR 50 million or an annual balance sheet of total not exceeding 43 million. Business that are larger than this may not own more than 25% of the capital of an SMEs (Statistics Finland, Cited 10.10.2016).

## 2.3 SMEs Functional Requirements to an ERPs System

The functional requirements for any SMEs largely depends on the type of business industry the enterprise is involved e.g. ecommerce, service industries, manufacturing, distribution, financial services or public sectors. Few basic functions that most or every SMEs require regardless of the industry are like accounting, invoicing, employee registrar, sales, ecommerce or various productive

tools like calendar, timesheet, marketing, various news and events information. Many SMEs who do not implement ERP systems use services provided by different vendors to meet the demand of the enterprise. Using services from various vendors has problems that they aren't synchronized to each other and many of the data needs to be entered manually. To overcome these problems enterprises need to implement an ERP software or solution that fits the business need.

## 2.4 Odoo

Odoo (previously known as TinyERP, OpenERP and now Odoo) is an open core enterprise resource planning platform. Odoo source code for the Open Object framework and core ERP modules are maintained by Odoo S.A. based on Belgium. Its customized applications, support and other services are provided by a global community and official partners all around the world. The first version of Odoo (previously known as TinyERP) was released on Feb. 2005. Odoo SA releases major community and enterprise version of Odoo every year. The latest version of Odoo 10.0 was released on 5th October 2016. It's now a complete module of integrated business applications for small, medium and large business.(Odoo.com, cited 10.10.2016)

Odoo modules include billing, accounting, manufacturing, purchasing, warehouse management, project management, finance, accounting, CRM, POS, ecommerce CMS and over 100 others that support various business processes across the enterprise. (Odoo.com, cited 10.10.2016)

Odoo is an open core suite of enterprise management applications. It provides subscription based proprietary enterprise software and cloud hosted software as a service(SaaS) and a downsized community edition. (Odoo.com, cited 10.10.2016)

# 3 WORKING WITH ODOO

This chapter includes odoo ERP Architecture, different installation options and a short guided tour of Odoo that helps business to manage Odoo on their own.

## 3.1 Odoo ERP Architecture

To work with Odoo ERP it is important to know its architecture. Odoo ERP system is formed from three main components

- PostgreSQL database server, it consists all the databases and key data elements of the Odoo ERP system
- Odoo application Server, it consists all the enterprise logic system,
- Web server consist of application called Open Object client-web which helps people connect to Odoo using standard web browsers and is not required if connected using GTK client.

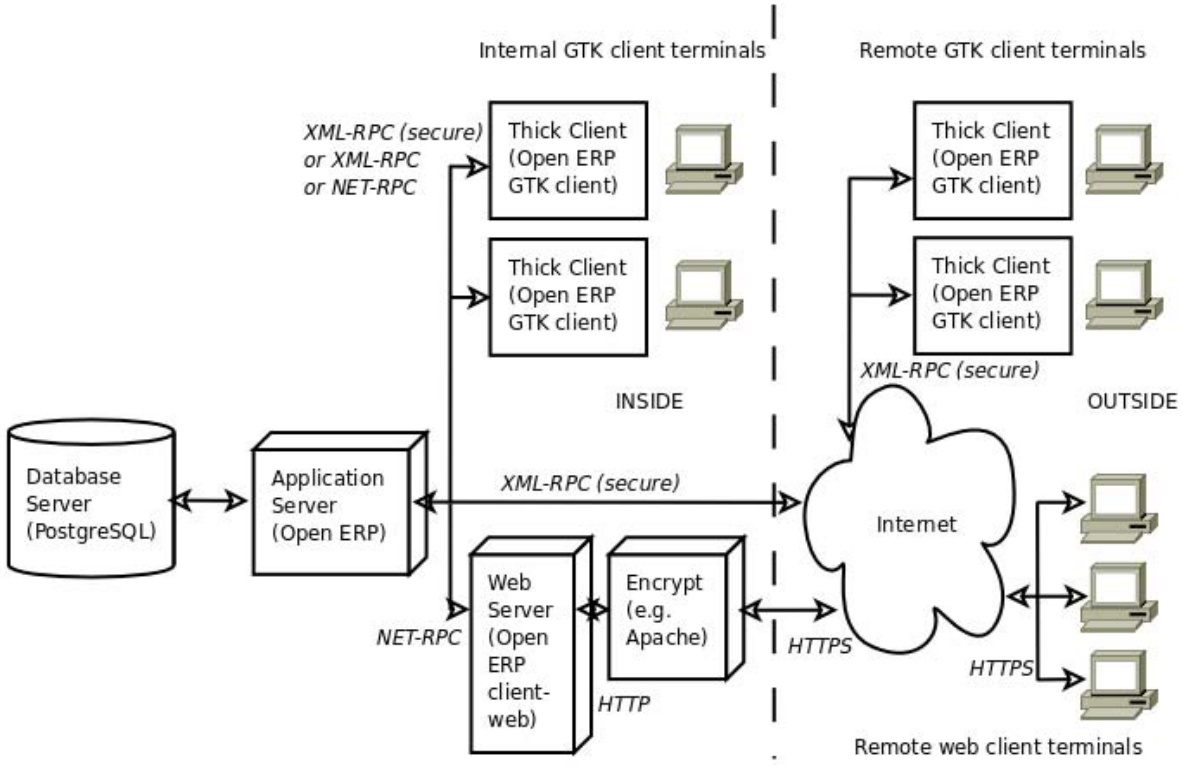


*FIGURE 1. The architecture of OpenERP (Pinckaers, F., Gardiner, G. & Vossel, E., 2011(28-29).*

Odoo ERP can be accessed using a web browser pointed at Odoo client-web server or by using an application client (GTK client) installed on each computer. Both methods of access provide similar facilities and can be used on the same server at the same time. (Pinckaers, F., Gardiner, G. & Vossel, E., 2011(28-29).

## 3.2 Odoo V.10.0. Installation Guide

This chapter will provide various installation options of Odoo and basic Installation guide of the latest Community version of Odoo V 10.0. There are various options to install Odoo or not to install at all. Odoo demo is also available on the Odoo website for getting the quick feel of Odoo. Odoo has two different editions, the Community version and the Enterprise version. Use of Enterprise version is possible only on the cloud (SaaS) fully managed by Odoo S.A. Getting access of Enterprise version code is limited to Enterprise customers and partners. The community editions of Odoo is freely available for download.

### 3.2.1 Software as a Service (SaaS)

This is the fastest and easy way to test the features of Odoo Enterprise version. Odoo provides one month of trial version with one app free for unlimited users. The SaaS version of Odoo is incompatible for complex customization custom modules or with the Odoo apps store. (Odoo.com, cited 10.11.2016)

Odoo provides free and unlimited user access of database for teachers and students where teacher can build a course with a sample company data and share it with students. Teachers can manage the access of users(students) from their account. Students can just select the course and get a sample company data to practice on. It is available online (SaaS) so the students and teachers can work from home or anywhere else without installing on their computers. This saves the time and costs for schools, teachers and students as it is available for free. The database is valid for ten months from the date of creation. (Odoo.com, cited 10.11.2016)

### 3.2.2 Source Installation

This sub chapter will explore the practical approach of configuring, maintaining and monitoring the Odoo deployment by the SMEs on their own. It will help SMEs to understand the core principles of deployment such as managing installation, updates and optimization for daily use. Various other independent installations can be done e.g. windows packages for evaluation purposes. Installing Odoo on Linux system is slightly more difficult than other installation but it is recommended for production purposes and is easy to keep up to date. (Odoo.com, cited 10.11.2016)

**Installation of Odoo on Linux Ubuntu**

This section shows the step-by-step technical procedure for installation and configuration of the freely available community version of Odoo 10.0. on Ubuntu linux.

**Step 1: Update apt Source Code**

*apt-get update*

**Step 2: Install Updates**

*sudo apt-get upgrade*

**Step 3: Install Python Dependencies required**

As Odoo requires lots of python modules. Install all the Python packages below

*udo apt-get install python-dateutil python-docutils python-feedparser python-jinja2 python-ldap python-libxslt1 python-lxml python-mako python-mock python-openid python-psycopg2 python-psutil python-pybabel python-pychart python-pydot python-pyparsing python-reportlab python-simplejson python-tz python-unittest2 python-vatnumber python-vobject python-webdav python-werkzeug python-xlwt python-yaml python-zsi poppler-utils python-pip python-pypdf python-passlib python-decorator gcc python-dev mc bzr python-setuptools python-markupsafe python-reportlab-accel python-zsi python-yaml python-argparse python-openssl python-egenix-mxdatetime python-usb python-serial lptools make python-pydot python-psutil python-paramiko poppler-utils python-pdftools antiword python-requests python-xlsxwriter python-suds python-psycogreen python-ofxparse python-gevent*

**Step 4: Install Odoo Dependencies**

*sudo apt – get install -y npm*

*sudo ln -s /usr/bin/nodejs /usr/bin/node*

*sudo npm install -g less less-plugin-clean-css*

**Step 5: Install and Configure PostgreSQL**

Install PostgreSQL using *apt-get* command

*sudo apt-get install python-software-properties*

*sudo vim /etc/apt/sources.list.d/pgdg.list*

Add a line for the repository

*deb http://apt.postgresql.org/pub/repos/apt/ xenial-pgdg main*

*wget --quiet -O - https://www.postgresql.org/media/keys/ACCC4CF8.asc | sudo apt-key add –*

*sudo apt-get update*

*sudo apt-get install postgresql-9.6*

**Step-6 Create database user for Odoo**

*sudo su postgres*

*cd*

*createuser -s Ubuntu_user_name*

*exit*

**Step 7: Create Odoo user and group**

*sudo adduser --system --home=/opt/odoo --group odoo*

**Step 8: Install Gdata**

*cd /opt/odoo*

Go to the link “https://pypi.python.org/pypi/gdata” and download the gdata-2.0.18 and transfer the file to server or through terminal follow the steps below:

*sudo wget*

*https://pypi.python.org/packages/a8/70/bd554151443fe9e89d9a934a7891aaffc63b9cb5c7d60897*

*2919a002c03c/gdata-2.0.18.tar.gz*

*sudo tar zxvf gdata-2.0.18.tar.gz*

*sudo chown -R odoo: gdata-2.0.18*
*sudo -s*
*cd gdata-2.0.18/*
*python setup.py install*
*exit*

**Step:9 Odoo 10 download from GitHub**

Get the latest Odoo 10 from github repository. Download the Zip file from URL: “https://github.com/odoo/odoo/tree/10.0". Transfer the same file to /opt/odoo directory on server through ftp or follow the steps below:

*cd /opt/odoo*
*sudo wget https://github.com/odoo/odoo/archive/10.0.zip*
*sudo unzip 10.0.zip*
*sudo chown -R odoo: odoo-10.0*

Or clone Odoo Git

*git clone --depth=1 --branch=10.0 https://github.com/odoo/odoo.git /opt/odoo/odoo*
*sudo mv odoo/ odoo-10.0/*
*sudo chown -R odoo: odoo-10.0*

**Step:10 Create Odoo log file**

*sudo mkdir /var/log/odoo*
*sudo chown -R odoo:root /var/log/odoo*

**Step:11 Edit Odoo configuration file**

*sudo cp /opt/odoo/odoo-10.0/debian/odoo.conf /etc/odoo.conf*
*sudo chown odoo: /etc/odoo.conf*
*sudo vim /etc/odoo.conf*

Copy and paste below content in config file with correct addons paths

*[options]*

*; This is the password that allows database operations:*

*; admin_passwd = PASSWORD*

*db_host = False*

*db_port = False*

*db_user = odoo*

*db_password = False*

*addons_path = /opt/odoo/odoo-10.0/addons*

*; Log Settings*

*logfile = /var/log/odoo/odoo.log*

*log_level = error*

**Step: 12 WKHTMLTOPDF for Odoo**

Download wkhtmltopdf version from wkhtmltopdf.org depend on your system arch (32 or 64 bit)

*sudo wget http://download.gna.org/wkhtmltopdf/0.12/0.12.1/wkhtmltox-0.12.1_linux-trusty-amd64.deb*

*sudo dpkg -i wkhtmltox-0.12.1_linux-trusty-amd64.deb*

*sudo cp /usr/local/bin/wkhtmltoimage /usr/bin/wkhtmltoimage*

*sudo cp /usr/local/bin/wkhtmltopdf /usr/bin/wkhtmltopdf*

**Step:13 Start Odoo server**

*cd /opt/odoo/odoo-10.0*

*./odoo-bin*

**Step: 14 Open web browser and access Odoo 10**

*http://localhost:8069*

### 3.3 Guided Tour and basic Settings

This chapter helps users to discover Odoo and familiarize with different functions. This guided tour introduces with some of the system features of Odoo. Odoo is a simple software to operate compared to any other proprietary ERP systems. Odoo has very simple and elaborative user

interface. To know more about guided tour and basic settings make sure that your database has some demonstration data and you have access to the Odoo server.

**Database Management**

After source installation of Odoo as outlined in previous chapter to create a new database for *database_db1* (demo company database) with demonstration data. For creating a new database, you need to set up a master password if you haven't set up. Setting up master password is quick and easy open your web browser and follow the screen instructions. To create a database click on *databases* from *login* page and complete the fields on *Create Database* form:

*Master password*: *admin* by default,

*Database name: database_db1* (demo company database)

*Email: testuser@gmail.com*

*Password: admin* (easiest to remember for demo purpose)

*language: English (US)* default

*Country: Finland*

*Load demonstration data checkbox: checked*

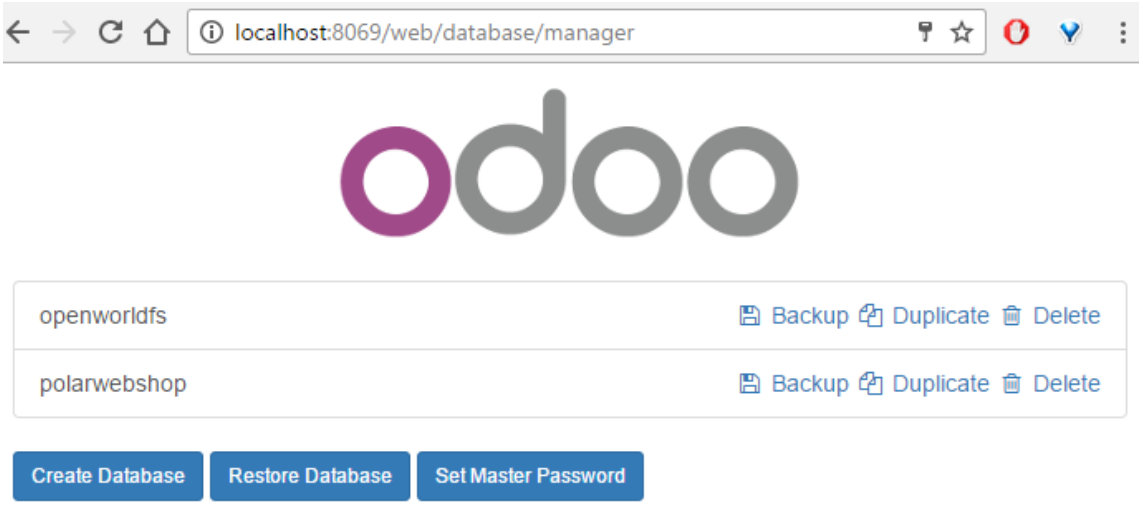


*FIGURE 2. Database Manager*

You can create a new database, restore database, set master password, backup, duplicate and delete the database using the above screen *login→Select →Manage Databases*

**Toolbar**

After creating the database *database_db1* and logging to it you will be taken to a Odoo main menu with three menus *Apps*, *Settings and Administration.* Using apps menu, you can install and update different apps per the need of your company. To install new app just click on *Install* and the app gets installed within few seconds. At settings menu, you can see the overall dashboard of the database, create or import new users, companies, partners as well as load different language translations of Odoo.

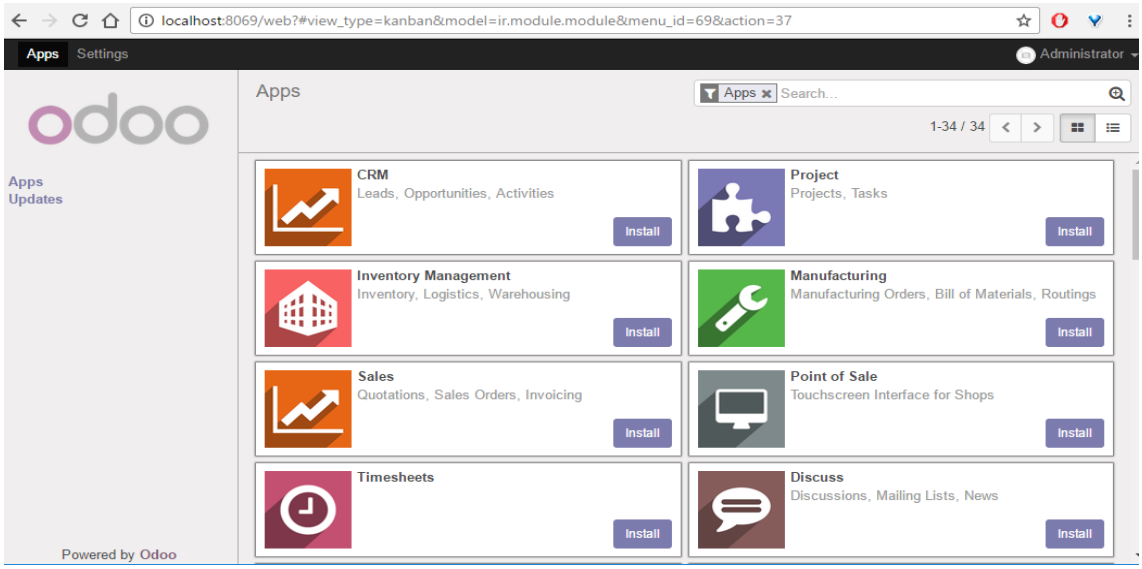


*FIGURE 3. Main menu of Odoo database_db1*

To create/import new user, go to *Main menu*→settings→*Users*→*Create/import*

To create/import new company's *Main menu*→Settings→*Companies*→*Create/import*

for loading different language translations *Main menu*→Settings→*Translations*→*Load a Translation*

Administrator menus has submenus where user can read documentation, request for support, change administrator preferences (change password, language, time zones, email and email signatures), log in to your online Odoo account and log out from the database.

# 4 ODOO IMPLEMENTATION GUIDE FOR SME'S

The implementation of Odoo ERP passes through different phases of implementation like evaluation, planning, customization, deployment, users training and support and maintenance. *"Implementation encompasses the whole process of integrating and deploying Open ERP(Odoo), including evaluating it, establishing specifications, planning the deployment, the configuration of the software, loading data, installation and training the users. It does not generally extend to software customization, nor support and maintenance".* (Pinckaers, F., Gardiner, G. & Vossel, E.,2011) This Chapter gives the overview of different processes that should be taken into consideration while implementing Odoo ERP in any SMEs.

## 4.1 Needs Assessment and Planning

Need assessment and planning is the most important pre-implementation phase of ERP implementation. Poor need assessment and planning is the main reason for the project failure (Brown, C. & Vessey, I. 2003). In this stage company should separate the management team responsible for implementing the ERP system. Implementing an ERP in any company requires various changes in the various business processes (Turban et al. 2008). Clear need assessment plan and implementation strategy is necessary to be delivered to IT staffs on time. The implementation strategy describes the plan for change that ensures alignment with overall corporate objectives and goals (Al-Mashari & Zairi, 2000). The need assessment plan includes

- System requirements
- Features to be configured
- Adaptation of the software applications to different business processes
- Details of existing systems, data migration
- A clear implementation timeline

ERP implementation is business IT process. It involves both business processes and information technology.

## 4.2 Vendors Selection

As SMEs lack manpower to run the Odoo ERPs system on their own selecting a reputable locally operating Odoo ERP vendor with good implementation portfolio is the best options for any SMEs. The list of Odoo official vendors operating in different countries can be checked from Odoo official website. Choose a vendor who is cost friendly as well as has the sufficient skills needed for software customization if required. Discuss clearly with the vendor about the requirements and out of box Odoo features. Avoiding customization gives SME's a huge benefit on maintaining cost, future software updates and data migration.

## 4.3 Deployment

*"Deployment is the process of putting an Open ERP database into a production-ready state, where it can be used by everyone in your business for their daily work. You would usually configure Open ERP and load data into it on one development system, train staff on that or another training system and deploy it onto a production system that has better protection against failure, better security and more performance"* (Pinckaers, F., Gardiner, G. & Vossel, E.,2011).

Odoo ERP complete architecture includes a database server, an Odoo ERP application server and a web-client server. The deployment can be carried out in various ways

- SaaS (software as a service), an on-demand service managed by a hosting company. The system is configured to as company needs
- Internal installation, generally managed by the SMEs themselves or outsourced to an Odoo ERP partners
- Hosting by the server supplier.

The first two options are the commonly used options for Odoo ERP deployment.

## 4.4 User Training

User training is very important for the success of the Odoo ERP implementation. Failure in education and users training causes implementation problems (Umble & Umble, 2002, p. 27) Training employees help SMEs take full advantage of the functions and services offered by Odoo ERP. Odoo Academy offers subscription based online 'Odoo Functional' training for its users and 'Partnership Knowledge Base' for its partners. The Odoo functional subscription fee is $125 per

month or $1,000 for one year access. This training gives an overview of major functionalities and contents of Odoo. The training material includes PDF's, videos and exercises.
(training.odoo.com, cited1.12.2016)

### 4.5 Maintenance and Support

ERP maintenance is very important service provided by ERP vendors, partners in the ERP post-implementation phase. This maintenance covers the various activities to support and extend existing systems. It includes the handling of user requests and user training, the implementation of changes to the existing functionality of the system, and the implementation of patches and software updates provided by the ERP vendor (Ng et al., 2002). As Odoo introduces new version of Odoo every year so it is very crucial to do regular maintenance of the system. Various important security updates need to be addressed in time.

User support involves various wide range of tasks. These include answering how-to questions, consulting users in the use of the system, solving user problems and analyzing errors in the application, serving as first contact for change requests, searching for ERP vendor bug fixes, bug reporting to the ERP vendor, and preparing and performing user trainings (Ahituv et al., 2002; Nah and Delgado, 2006; Ng et al., 2002; Ng et al., 2003b). ERP user support requires not only technical system knowledge but also knowledge about work processes in the ERP system to address user requests adequately (Ahituv et al., 2002; Bajwa et al., 2004; Wenrich and Ahmad, 2009).

Odoo and Odoo partners offers various maintenance and support services. Users can also use help forums moderated and maintained by the Odoo community users provided for free on official Odoo website.

# 5 BENEFITS OF USING ODOO

Odoo user base is growing rapidly every year. It is increasing its popularity among SMEs because of its openness which makes it easier to modify and customize. It is used by over two million users all over the world. (Odoo.com, Cited 20.11.2016). This chapter will explore in brief about the benefits of using Odoo ERP over popular proprietary ERP software vendor SAP (SAP Business One).

**Ease of Use**

Odoo ERP is easy to use and understand. It has a clear user interface. It is easy to navigate across different functions as all the applications installed by the company appears on toolbar. It handles its wide range of functions easily so making smaller companies to Implement it.

**Quick Implementation**

Odoo ERP can be implemented across any companies within few months. There are strong communities, Odoo partners who are specialized in doing quick implementation. Different Odoo modules can be installed with just a few clicks.

**The Open Ecosystem**

Odoo has two versions of software's one light Community version which lack various functions and is free to download and use and an enterprise version which is fully supported by the software vendor and costs per user. Odoo benefits largely from the work of its active community and its contributions. Odoo also provides fully supported cloud ERP(SaaS) with subscription plans.

**Easy Customization**

ERP systems are theoretically based on industry best practices, and their makers intend that organizations deploy them as is (Vilpola, Heidi, I., 2008) (Fryling, Meg ,2010). In practice, even a best-application package can meet only 70 percent of the organizational needs. An organization must change its process to integrate or customize the software to meet its needs. When an organization customizes the software to meet its needs, the total cost of implementation rises. The more the customization the greater the implementation costs (Judith M. Myerson, 2002). Odoo is flexible and easy to customize as its source code is easily available to download on Git. its users

can easily customize per their requirements. It uses python programming language which is a popular programming language.

**Wide Coverage of Business Applications**

Odoo covers wide range of business applications. The community edition of Odoo consists thirty-four core business applications which can be useful to any businesses. As Odoo is an open source and is developed by community it has 54,000+ developers all around the world developing 312 new apps every month in 23 different languages (Odoo.com, cited 23.11.2016). The software vendor acts as an orchestra leader in the community and guides the development, quality inspection and approvals of the developed modules.

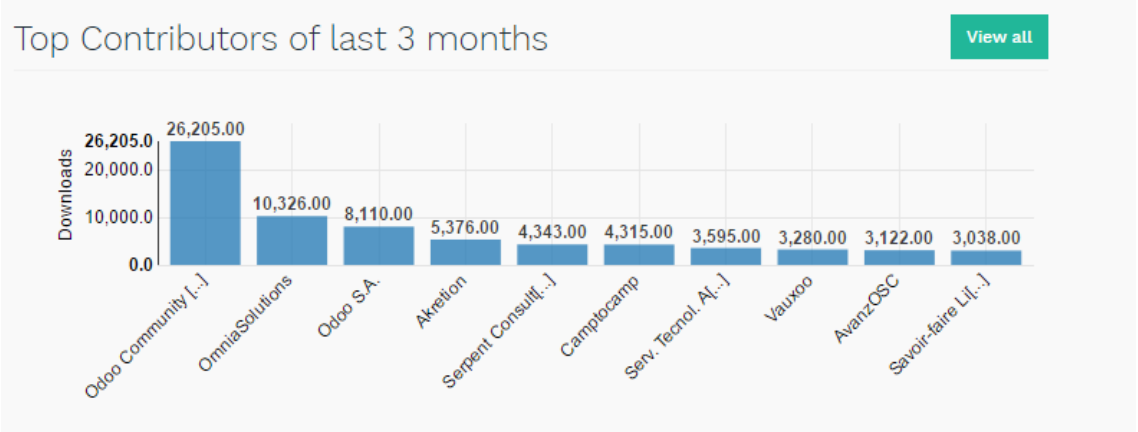


*FIGURE 4. Top Odoo modules contributors (Odoo.com, Cited 23.11.2016)*

These statics of modules and apps contributions cannot be compared with any other ERP vendors.

**Fully Integrated Geographical Information System(GIS)**

It is an Odoo module that adds spatial/GIS capabilities to Odoo it allows Odoo users to Visualize and query their business information on map. GeoEngine relies on OpenLayers and PostGIS technologies. (oca.github.io,2015). It helps businesses to get their marketing data on a map with sales revenue per city per country etc. Various applications that benefits form Odoo GeoEngine are Geographical queries and filters (e.g. last sales made within 5 Km), geo-marketing, stock location, fleet management, dashboards, assets localization etc. It also helps businesses to create personalized maps directly from user interface. (Delsart,Y., Nieuwenhuysen,C., 2011)

**High Integration Capabilities**

Odoo being an open source software offers high integration capabilities to other third party apps. It can be easily integrated using Odoo connector which is a powerful framework to develop any kind of bi-directional between Odoo and any other software or service. Some of the popular connectors based on this framework are Magento Connector, Prestashop Connector, solerp (Solr Connector), Odoo Multi Company, CMIS, Odoo Asynchronous import module, Salesforce Connector, Google Spreadsheet Connector, WooCommerce Connector (Odoo connector, Cited 20.11.2016)

**Cost Effective**

Implementation of ERP system is a heavy Investment of money and workforce in any business. Implementation of ERP software is very expensive and risky option especially for SMEs. Small businesses cannot afford heave licensing fees for the proprietary software like SAP Business One. Proprietary software's are expensive to customize, integrate, maintenance and requires high level of education and training to use. One of the main reasons opting to Odoo is its lower implementation cost. Odoo has very clear and effective pricing strategy. The easy and effective way to test Odoo features in to test it online for free. All the Odoo features can be tested by just paying 20€ per month. let's see the Implementation cost figure in detail of Odoo vs Sap without including installation and maintenance costs. the figures are in percentage

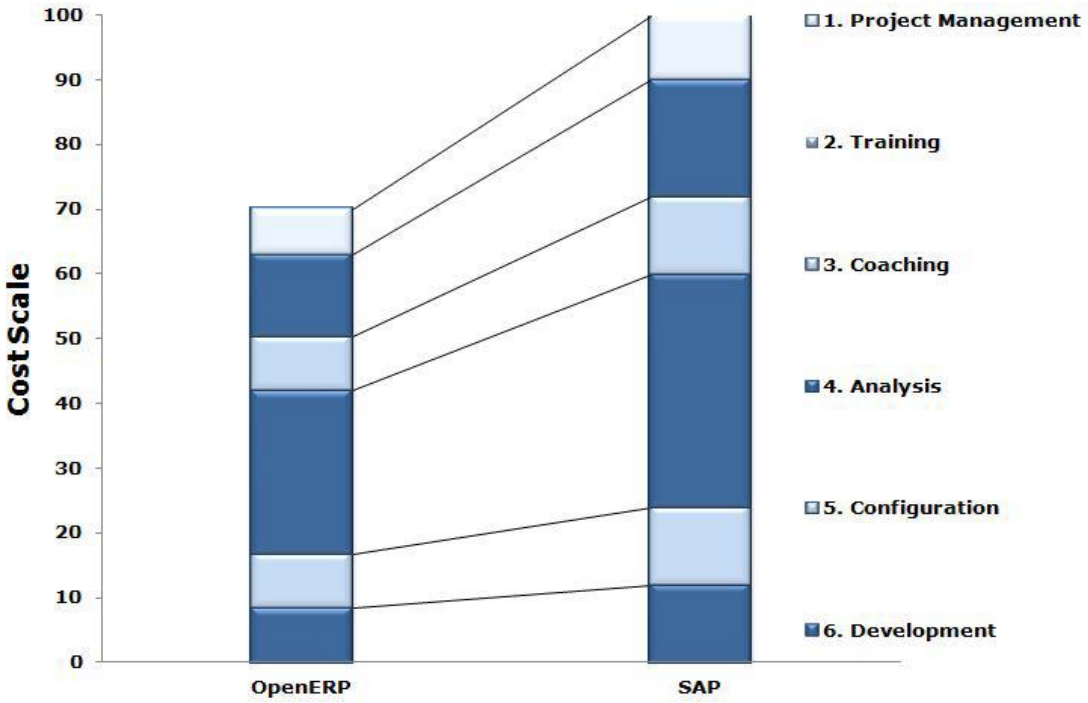


*FIGURE 5. Direct Implementation Cost SAP vs OpenERP (odoo) (Delsart,Y. et all ,2011)*

In Sap the project management cost represents 10% of the implementation cost which can reach up to 25%. The customization cost represents around 60% of the implementation cost,30% for change management with 60% allocated for training.
In Odoo(OpenERP)10% for project management 60% for customization ,30€ for change management. in overall the implementation cost for Odoo is reduced by 30%-40% than that of SAP. (Delsart,Y., Nieuwenhuysen,C.2011)

**Widely used Efficient Programming Language**

Odoo uses widely used Python programming language and Postgres database. Python is a free and open source software with a community based development model. Its syntax allows programmers to express concepts in fewer line of code than possible in languages such as C++ or java (McConnell & Steve, 2009). As Python is a widely used popular scripting language it is easier to find developers worldwide which makes Odoo customization and development cheaper for businesses.
Whereas SAP uses programming language called ABAP4 which is a high-level programming language created by SAP itself. It is an application specific fourth generation language. ABAP is hard to learn and not a tool for direct use for non-programmers and easy to learn for programmers. Which makes SAP expensive for customization and developments as the ABAP developers are rare.

**Security**

Odoo is highly secured as it undergoes continuous code reviews which include security check for all new contributed code. Odoo is designed to prevent most types of security issues like SQL injection, XSS attacks and the framework itself prevents RPC access to private methods, making it harder to introduce exploitable vulnerabilities. Odoo provides two main data driven mechanism to manage or restrict access to data (Odoo.com,23.11.2016).

# 6 ONLINE TRENDS AND ATTITUDES TOWARDS ODOO

Due to the unavailability of Odoo users willing to respond to surveys, a different approach was taken. Various forums and online reviews were analyzed to study the trends and attitudes of users towards Odoo.

A popular independent software rating website softwareinsider collected the user reviews on Odoo and SAP. Users reviewed the software applications based on ease of use, ease of doing business, features score and Implementation. the total number of respondents is 14. The highest score is 10. (softwareinsider.com, cited 1.12.2016)

For Odoo out of 14 respondents ease of use was given the total score of 6.50. Ease of doing business scored 9.00. Odoo features scored 6.00 and the implementation got 5.0. In comparison, SAP got 4.0 score on ease of use, ease of doing business got 3.0 points, features score got 6 points implementations got 7 points. (softwareinsider.com, cited 1.12.2016)

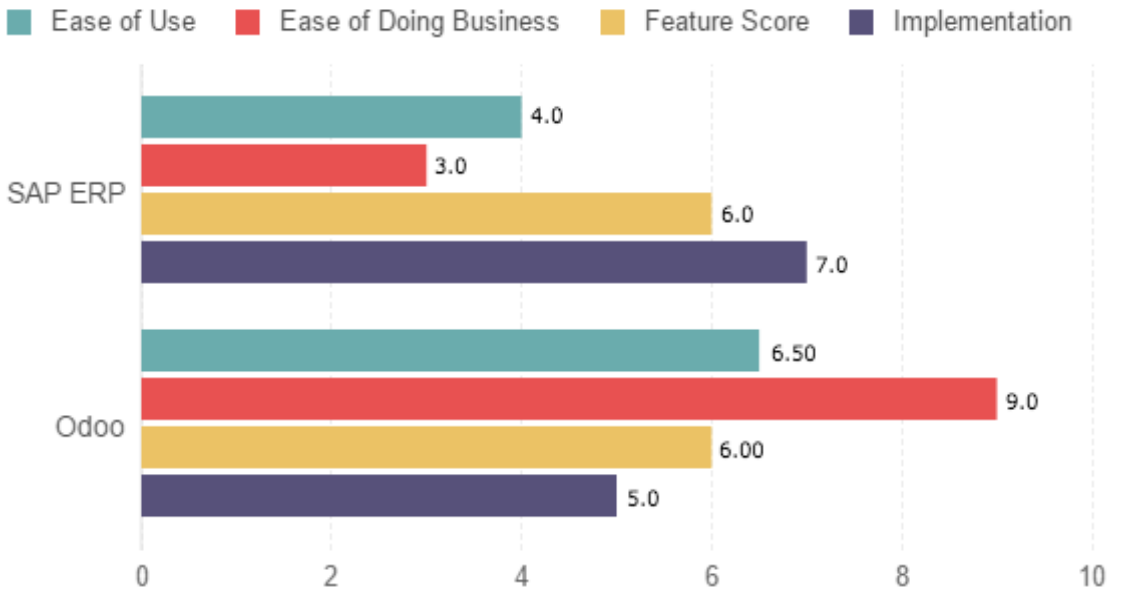


*FIGURE 6. Odoo Overview (softwareinsider.com, cited 1.12.2016) erp.softwareinsider.com/compare/218-246/sap-erp-vs-Odoo/*

The pricing information was collected from Odoo official website. The pricing of both software varies with the total number of users and features used. The table below shows the basic cloud service provided by both the vendors. It difficult to find SAP pricing because SAP pricing is quote based pricing. The community version of Odoo is free of cost whereas the enterprise version of Odoo hosted online costs $25 per user for a month which is about $240 a year per user and $75,000 for five years for 50 users. SAP business one costs $2,975 per user perpetual+18% per year and $282,625 for five years for 50 users. The figures show that SAP is highly expensive compared to Odoo. (Odoo.com, Cited 1.12.2016)

| Pricing & Conditions | Odoo Online | SAP Business One |
|---|---|---|
| PRICING * | $25 / user / month | $2,975 / user perpetual + 18% per year |
| Contract Duration | Monthly / Annual | Annual |
| Five Year Cost, 50 Users | $75,000 | $282,625 |
| Free Trial | ✓ * | × * |
| New Version Upgrades Included | ✓ | ✓ |
| Update Service Included | × | × |
| Cloud Offer Available | ✓ | ✓ |

*FIGURE 7. Odoo online Vs SAP Business One Pricing (Odoo.com, Cited 1.12.2016) www.odoo.com/page/compare-odoo-vs-sap*

Popularity of Odoo formerly known as OpenERP is growing rapidly. Google trends interest over time shows the fast growth of Odoo. Interest over time where numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. Likewise, a score of 0 means the term was less than 1% as popular as the peak. Odoo was 77% popular and shows the rapid growth with time whereas SAP was 32% popular and shows a steady curve.(google.com/trends, cited 01.12.2016)

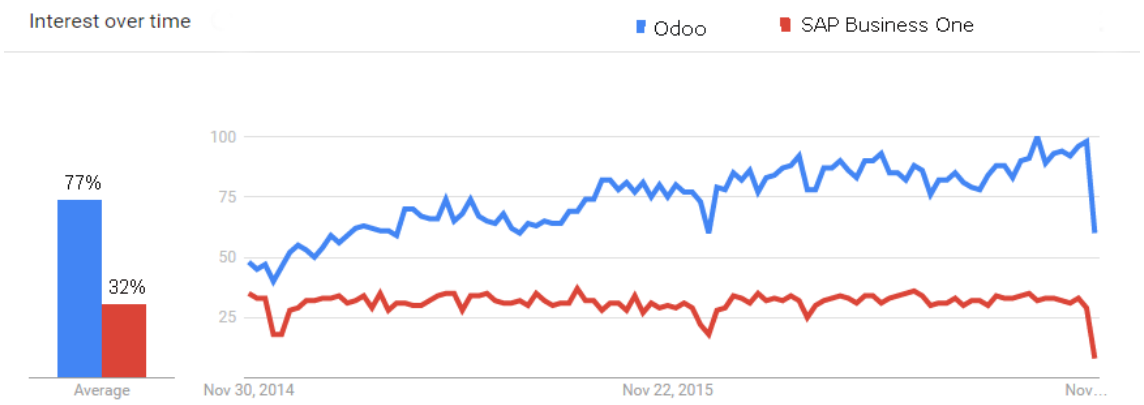


*FIGURE 8. Odoo Vs SAP Business One search popularity trends.* (google.com/trends, cited 01.12.2016) *https://www.google.com/trends/explore?date=2014-11-30%202016-12-01&q=Odoo,%2Fm%2F040nbg*

# 7 CONCLUSION

ERP implementation in any business is not just a walk in a park, it requires a lot of dedication, time and effort on research, planning and decision making. ERP implementation in any businesses involve process re-engineering and optimization. Due to many reasons the biggest challenges for business is choosing the right solution with the right vendor and its effective implementation according the need of the business. Analyst firm Gartner estimates that 55% to 75% of ERP projects fail to meet their objective due to many reasons one of the main reason being the lack of transparency where 71% of people thought that vendor could be more honest when it comes to the total cost of the project other reasons were about not defining the true requirements as well as not getting full support from the executives (Gartner, Cited 2016).

Odoo has come a long way since it was first developed as TinyERP in 2005 by Fabien Pinckaers. In ten years, it has rapidly evolved as one of the mature software provider in the enterprise software business. Open source ERP software has finally made the way in the enterprise software industry which is largely dominated by industry's main players SAP, Oracle. Odoo in 2016 is ranked as the most popular open source ERP software with large group of community members and users behind its success (ERP Systems-Popularity Ranking Open Source, Cited 1.12.2016). Implementing Odoo gives the freedom of updating and modifying the source code and many other benefits.

Different Online trends were studied to gather the data on Odoo features, customer satisfaction. The data showed that the customers are happy overall with Odoo then any other ERP software's. Most of the online forums had reviews on older versions of Odoo which were not relevant to recent versions.

# 8 DISCUSSION

An Open ERP Odoo implementation guidebook for SMEs was a challenge as a bachelor's thesis topic since there were many things that needed to be considered. I found the topic very interesting as I had never used or studied any ERPs before. To prepare an Odoo ERP guide I first needed to study about it and use it myself to be clear so I can write about it. I used Odoo for few weeks playing with the demo data and started to find information about it on the web. I was fascinated that it also had finish language translations and two official implementation partners in Finland. I wanted to make the thesis guide as general as possible so it was easier for anybody from students to decision makers to be able to understand and install and use Odoo by their own. I quickly learnt that this thesis had many limitations for research and data collections. ERP is an internal system of any business so it's impossible to find its users, I found few businesses who use Odoo but didn't find anybody to talk about their internal system. I contacted the two official Odoo partners in Finland one didn't respond to the email one responded, I had prepared customers interview questionnaire and found out that the Odoo partner haven't conducted any kind of customer survey. The thesis didn't have any commissioner or any case company who was willing to implement Odoo in their systems, and because of this the research was limited to data found online.

During the preparation of the thesis I learnt to install and use Odoo. Most of the apps had clear interface so it was easier to use. It is easier and very simple to build an e-commerce website on Odoo e-commerce than building on Magento or WordPress. BIT degree doesn't have any ERP compulsory course. I think Odoo needs to considered in BIT degree courses.

I think a true guide book can help many SMEs save money and time and make ERP implementation a success. Odoo is already matured and widely popular in ERP industry as it has more than two million users with more than seven thousand three hundred apps in Odoo apps store. It has already surpassed any of its competitor in terms of users in ERP industry. It seems that it is future of ERP industry by seeing its popularity trends. Odoo was initially released as open source software but since V9.0 release, company released two versions a light open source free community version and subscription based proprietary Enterprise version and cloud hosted SaaS.

For further research implementation of Odoo in real case company can be done, University should consider teaching Odoo as an alternative to SAP because of this university can save a lot of money on licenses. Odoo database is free for ten months for educational purposes after ten months the database will automatically expire, it can't be saved but the account will remain active and teachers can recreate new ones which is valid for another ten months (Odoo.com, Cited 1.12.2016). Independent modules of Odoo can be studied in brief. Odoo apps can be developed for research as Odoo uses Python programming language for development.

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